Journal of the Society of Arts.

FRIDAY, OCTOBER 15, 1869.

Announcements by the Council.

NATIONAL EDUCATION LEAGUE.

The Council met on Friday last, the 8th inst., and resolved that a donation of twenty guineas be given to the National Education League which met at Birmingham during the present week, and that a deputation from the Council, with the Secretary, be requested to attend the meeting. The following letter has been addressed to the Secretary of the League :—

Society for the Encouragement of Arts, Manufactures, and Commerce, October 8th, 1869.

SIR,—The Council of this Society have much pleasure in sending (enclosed) a cheque for twenty guineas as a donation to the funds of the National Education League, and have directed me to attend with a deputation, and represent the Society at the meetings of the League at Birmingham next week. The Rev. Wm. Rogers, and Messrs. E. Chadwick, C.B., and E. Carleton Tufnell, have been requested to form the deputation. The Council think it right to say that they cordially concur in the programme of the League, in so far as its object is to ensure the groundwork of instruction to all the children of the United Kingdom, and that they shall not be less well educated than children in Germany, Switzerland, Sweden, and Norway; but as a question of general policy, and as representing many different opinions among the numerous members of the Society, they hesitate at the present time to pledge the Society to all the details of the League programme. The Council think it desirable that all the various modes of ensuring universal instruction to the children of the United Kingdom should be amply discussed from many points of view, and they intend to invite the members of the Society and others to a discussion of them after the meetings have been held in Birmingham, Manchester, Newcastle, &c. For the consideration of the Birmingham meeting, the Council transmit a paper, which has been prepared by some members of the Council, and which appears to be worthy of serious attention.

I have the honour to be, Sir,
Your obedient servant,
P. LE NEVE FOSTER, Secretary.

George Dixon, Esq., M.P.

An account of the proceedings of the League will be given in a subsequent number of the *Journal*.

IMPROVED CABS.

The Council of the Society of Arts offer the following medals for improved hackney carriages specially suited to the metropolis :—

The Society's Gold Medal for the best and most convenient open hackney carriage for two persons.

The Society's Silver Medal for the second-best ditto.

The Society's Gold Medal for the best and most convenient closed hackney carriage for two persons.

The Society's Silver Medal for the second-best ditto.

The Society's Gold Medal for the best and most convenient hackney carriage for four persons, either open or closed, or both.

The Society's Silver Medal for the second-best ditto.

Lightness of construction, combined with adequate strength and durability, will be especially considered in making the awards.

The awards will be made after actual trials of the carriages extending over a certain period.

Communications describing the carriages must be sent to the Secretary of the Society of Arts before the 1st January, 1870, the carriages to be sent to a place hereafter to be appointed.

The Council also offer the Society's Silver Medal for the best instrument, to be affixed to a cab or other hackney carriage, for indicating the fare as between the passenger and the driver, whether by registering the distance travelled or otherwise, and which instrument shall also indicate, for the convenience of the cab-owner and of the driver, the total distance travelled during the day and the total amount earned. The instruments competing, with full descriptions of their construction, to be sent to the Society's House before the 1st January, 1870.

Competitors may, at their option, sign their communications, or may forward with them sealed letters containing the name and address of the writer.

The Council reserve to themselves the right of withholding all or any of the medals, in case none of the carriages or instruments possess, in their opinion, sufficient merit.

In the trials of the several carriages, the small amount of vibration and noise will be duly considered by the judges.

SUBSCRIPTIONS.

The Michaelmas subscriptions are due, and should be forwarded by cheque or Post-office order, crossed "Coutts and Co.," and made payable to Mr. Samuel Thomas Davenport, Financial Officer.

Proceedings of the Society.

MUSICAL PITCH.

The following additional information has been received, and kindly forwarded through the Foreign Office to the Society :—

STOCKHOLM.

Stockholm, August 11th, 1869.

MY LORD,—I have the honour to acknowledge the receipt of your lordship's dispatch No. 1 of the 3rd instant, regarding certain information required by the Society of Arts respecting musical pitch, and to state, in reply, that your lordship's instructions to Mr. Jerningham, of the 16th of January last, on this head, were duly acted upon without delay

From information which I have just obtained from a competent authority, I learn that the subject is still under the consideration of the Academy of Music.

I have the honour, &c.,
NASSAU JOCELYN.

The Right Hon. the Lord Clarendon, K.G.

BRUSSELS.

Brussels, 14th October, 1869.

SIR,—At the request of the Minister of the Interior, I have the honour of forwarding to your Excellency, in answer to your communications of the 3rd of March and 5th of August, a printed copy of the report of the committee, appointed in 1862, for settling the questions relative to the maintenance of the pitch then in use, or to its being lowered in Belgium. In conformity with sections 4 and 5 of the report, a circular was addressed by the Minister of War, June 22nd, 1863, to the Commanders of the infantry and cavalry regiments, to request them to give orders to the military band-masters for carrying out the views of the commission. No other special measure has been taken for fixing the pitch. The Theatre Royal de la Monnaie, at Brussels, has adopted the normal pitch of 870 vibrations; the Conservatoire Royal de Musique at Brussels, and the Orchestra of Popular Classical Music, still keep the old pitch of 902 vibrations. The pitch of the king's private band is still higher.

I have the honour to be, Sir, &c., &c.,

BARON LAMBERMONT.

Report made to the Minister of the Interior on the question of Lowering the Pitch.

SIR,—The committee appointed by Royal decree of the 12th of April, 1862, for determining whether the pitch now in use in Belgium should be lowered or maintained, after having carefully examined the question, having had under its consideration the pitch used in the principal cities in Europe, has arrived at the following conclusions:—

1. That the great rise in the pitch took place at the period when Glück published his first French opera ("Iphigénie en Aulide") in Paris, that is to say, since 1774 to 1810, and that in this space of thirty-six years the rise was more than three commas, or more than one-third of a tone, as has been stated in the report of M. Taskin to the Committee of Arts, in Paris, dated 27th March, 1826, on a tuning-fork for comparison, invented by a musician of the Royal Chapel, named Matrot.

2. That this tuning-fork gave the three pitches of the Opera, the Opera Comique, and the Theatre Italien, in Paris, in 1826; that that of the Opera then made 882 vibrations in the second; the Opera Italien, 891; the Opera Comique, the highest of all, 896.

3. That the operas composed since 1810 by the most celebrated composers, Méhul, Nicolo-Isouard, Boïeldieu, Auber, Hérold, Adolphe Adam, and others, for the Opera Comique, and which form the stock pieces of all the theatres of France, Belgium, and even of Germany, were written for this pitch of 896 vibrations, afterwards raised to 902, and that no fatigue in consequence has resulted to the singers, because these masters had regard in their works to the natural limits of the voice.

4. That M. Lissajous, professor of physics, member of the committee appointed by the French government on the 17th January, 1858, to determine the number of vibrations for a standard intended to become the model pitch for the empire, proposed a lowering from 898 (the pitch of the opera at that time) to 891; but for reasons which it is unnecessary for the Belgian committee to enter into, the majority of the French committee decided that the pitch should be lowered a quarter of a tone, and fixed the standard number of vibrations at 870. They had not observed that this number of vibrations does not correspond to two commas, one-fourth, the exact measure of a quarter of a tone, but to three commas, one-third, that is to say, more than a third of a tone below the pitch of the Opera Comique.

5. That no improvement has been effected in the voices of the French singers in the space of four years elapsed since the lower pitch, that is the normal one, has been adopted. That the artistes do not sing with greater ease those operas which they said used to fatigue them by reason of the high pitch. In fact, at no period has the personal condition of the singing body of the Paris theatres been so bad as at this time.

6. That the tuning-fork of the Royal Conservatoire of Brussels, an old fork in use at the Ghent Theatre, and at the Casino in the same town 30 years ago, an old fork of the Opera Comique of Paris in 1820, that of the Theatre Royal of Brussels, one belonging to a member of the committee (a maker of brass instruments in use all over the country, in the regiments of the army, exported to England, America, and the North of France), the tuning-fork of the Philharmonic Society of London, that of the Berlin Opera in 1861, and, lastly, that of the well known Choral Society of Cologne of the same period, all give the same pitch, with slight variations in the number of vibrations. The mean of these forks is 902 vibrations per second. It should be observed that the tuning-fork of the London Philharmonic Society gives C as the key-note, as well as the tuning-fork of the different States of Italy, instead of A, which, in Belgium, Germany, and France, is taken as the pitch-note. The committee ascertained that the C of the Philharmonic tuning-fork sounds a minor third above the tuning-fork of the Brussels Conservatoire, from which it follows that the A of the English orchestras is in unison with that of Belgium, except those slight differences of which we have spoken. This, therefore, does not offer any serious obstacle to the uniformity of pitch of wind instruments, because that is regulated by the lengthening of the tube of the oboes and the mouth-pieces of the clarionets and the bassoons, by the lengthening the tube of flute and the crooks of brass instruments. In regard to bow instruments, their pitch can be regulated at will.

7. That the only lowering of the pitch in use in Belgium should be the simple operation of transposing to an exact semitone lower for exceptional cases, or where the vocal parts are written too high, which is managed without difficulty by the good orchestras of the Conservatoire at Brussels, of the Theatre Royal, and by l'Association des Musiciens. By this simple plan the pitch remains in reality as it is, and there is no fear of any disturbance in the manufacture of instruments, a consideration of the highest importance, as was shown by the International Exhibition in London. In fact, the same French makers of wind instruments, who, at the Paris Universal Exhibition, in 1855, had deserved praise, and obtained first-class medals for the accuracy of their oboes, horns, bassoons, clarionets, and flutes, only showed at the International Exhibition of 1862 inferior instruments, because of the forced adoption in France of a pitch fixed at 870 vibrations the second, and which suddenly lowered the *La* 28 vibrations as regards the opera, and 32 vibrations for other orchestras. From that resulted the necessity for changing all the proportions for placing and dimensions of the holes on the tube of each wind instrument, a delicate operation in which the makers have only succeeded by experiment. Thus, suddenly, the result of a long experience, by which a satisfactory accuracy had been attained, the fruit of constant study by the most eminent artistes, and of the persevering efforts of the most skilful makers, has been set aside. All this work has to be gone over again to make the new proportions to suit the normal pitch. It can be done, without doubt, but until that end be attained, instruments made to the pitch of 870 vibrations will be more or less imperfect. The facts on which it has been thought necessary to lower the pitch have been exaggerated, or rather perverted. It is said the voices of the singers of the present time deteriorate rapidly, and singers willingly say the pitch is too high; but to those who know the truth of these things, this very evident evil may be attributed to other causes. Besides, it is not to be denied that the majority of singers go beyond the limits of the written music, according to their caprice, and they willingly reach extra high notes, with no other result than that of satisfying their own vanity. In comparison to the fatigue which results from this strain-

ing, a difference of pitch of four commas is nothing. Sometimes the fault may be attributed to a composer, who, writing for an exceptional voice, is induced to yield to the *spécialité* of a singer, without considering how his music will suit the limits of general voices, and prepares for the latter difficulties, as has lately been seen at Brussels, in a work written for a singer whose high voice reached notes impossible for other singers.

8. Another reason, no less certain and still more active in the destruction of the voice, is the habit which singers now have of prolonging the note with effort and with a screech, which the public has often the bad taste to encourage and to applaud. No voice can resist the violence of these attempts; the inevitable result must be the rapid destruction of the best-toned voices. The pitch is not, therefore, to be blamed.

9. That if the pitch be lowered to suit some establishments, such as the conservatoires of the kingdom and the theatres assisted by government funds, a sort of anarchy will result from it in a free country like Belgium, where no compulsion can be put on the makers of instruments, musical societies, and professionals, to oblige them to give up the pitch which they have been in the habit of using, any more than the forbidding of painters to use a certain colour. Instead of a uniform pitch which the public might adopt, there might be two sorts, if we could have, as in a neighbouring country, an inspector of the pitch.

10. That the question of expense for the change of instruments is of great importance for the artistes, to whom the sacrifice would be very distressing, and also for the pupils of the conservatoires and the schools of music who play on wind instruments, the greater part of whom would be obliged to give up their studies, and also for the communal bodies of the towns, where theatres are supported by them. For the army, this expense would be enormous, for all the regiments would be obliged to have a fresh supply of their musical appliances. In France, this operation, which is only now begun, and is in the course of being carried out, will cost a million and a-half; the regiments of Garde Civique, also, which have musical bands, will have similar expenses to pay.

11. That in Belgium, as well as in Germany, the custom has existed for two centuries of having masses and musical services in which the organ is played in conjunction with other instrnments, a custom which does not exist in France, or which is only in use in the northern provinces. Formerly, organs were tuned a half-tone lower than orchestral wind instruments; this is called church pitch, in Germany *chorton* or choir pitch. At that time they employed only for church music violins, violoncellos, and double bass; the organ took the part of the wind instruments. There is no difficulty in adjusting stringed instruments to the pitch of the organ or of the church. But, when the performance of religious music became similar to that of the opera, it was necessary to tune the organ to the pitch of the other instruments, an operation which has consisted in shortening proportionately the pipes and adjusting the reeds. As regards new organs, they have been built during the last thirty years to the orchestra pitch, according to the fork in use. One consequence of lowering the pitch to 870 vibrations will lead inevitably to the necessity of lowering the pitch of the organs. However easy it may be to raise the pitch by shortening the pipes, it is not so easy to lengthen them for a lower pitch; the operation can only be effected by suppressing the pipe of the last note, and shifting all the others, from which results the necessity to replace pipes of the lowest notes in all the registers, which for all the notes of a great organ of 50 or 60 registers will cost a great sum of money, especially for the flute stops and such like, of 8, 16, and 32 feet, in metal and in wood.

12. That the reason alleged for the lowering of the pitch to 870 vibrations deserves no consideration, viz., that the amateur Belgians who play on the flute, clarionet, oboe, bassoon, &c., can no longer join in concerts in France, where their instruments will not be the same pitch as the orchestra, for the artiste, whose talent is sufficiently remarkable to give concerts successfully in a foreign country, can procure, without difficulty, the instrument he requires.

After the preceding observations, the Commission arrives at the following decisions:—

a. There will be no advantage in lowering the pitch to 870 vibrations the second.

b. All the inconveniences of such lowering, enumerated above, will be inevitably produced.

c. It is desirable that a standard should be adopted, so that in future the pitch should not be capriciously raised, whether in reality by the makers of instruments, or by the influence of the leaders of military music, who wish to obtain more brilliant effects from the bands which they direct.

d. Comparative experiments show that the pitch of the Royal Conservatoire of Brussels, and of the Theatre Royal of that city, can be taken for this standard, whilst they are in unison, for the most part, with those of the largest cities of Europe, except in some slight differences.

e. The average difference of the pitches gives 902 vibrations the second; in consequence, the Commission is uanimously of opinion—

1. That the pitch should not be lowered.

2. That it ought to be fixed, taking for standard that of the Brussels Conservatoire.

3. That a tuning-fork should be deposited with the Royal Academy of Sciences, of Letters, and of Beaux-Arts of Belgium, as well as in the offices of each of the directors of the Conservatoires of the kingdom.

4. That each of the military regimental bandmasters and of the Civic Guard should be provided with standard tuning-forks.

5. That the interference of the Minister of War will be necessary to compel bandmasters to use only instruments of the standard pitch.

6. That the leaders of orchestras will assist materially in maintaining the pitch invariable by no longer giving *La* from an oboe or any other instrument whose sound is changed by the length of the pipe, by influence of temperature, or by accidental causes, but by furnishing themselves with a pitch-pipe carefully tuned in unison with the standard fork.

(Signed) FETIS, President and Reporter.
DAUSSOIGNE-MÉHUL.
J. BLAES.
C. MAHILLON.
C. HANSSENS.
V. BENDER.
A. SAMUEL.

Dated Brussels, 9th April, 1863.

Proceedings of Institutions.

EXAMINATION PAPERS, 1869.

(*Continued from page* 854.)

The following are the Examination Papers set in the various subjects at the Final Examination held in April last:—

SPANISH.

THREE HOURS ALLOWED.

Candidates for the first-class certificate will have to translate the following passage into Spanish, to render into English or French several proverbs and idiomatic phrases, and to write in Spanish a short essay on the liberty of nations

Don Quixote was surprised at what he heard from the goatherd, and being still more desirous of knowing who the unfortunate madman was, he renewed his determination to search every part of the mountain, leaving neither corner nor cave unexplored until he should find him. But fortune managed better for him than he expected,

for at that very moment the same youth appeared descending towards them, and muttering to himself something which was not intelligible. The rags he wore were such as have been described, but as he drew near Don Quixote perceived that his buff doublet, though torn to pieces, still retained the perfume of amber, whence he concluded that he could not possibly be of low condition. When the young man came up to them, he saluted them in a harsh and untuned voice, but with a civil air. Don Quixote politely returned the salute, and alighting from Rosinante, with graceful demeanour and address advanced to embrace him, and held him a considerable time clasped within his arms, as if they had been long acquainted. The other, whom we may truly call the tattered knight of the woeful, as Don Quixote was of sorrowful figure, having suffered himself to be embraced, drew back a little, and laying his hand on Don Quixote's shoulders, stood contemplating him, as if to ascertain whether he knew him, and perhaps no less surprised at the aspect, demeanour, and habiliment of the knight, than was Don Quixote at the sight of him.

Don Quixote, translated by Jarvis.

Translate into English or French :—

1. Ausencias causan olvido.
2. A buena gana no hay pan duro.
3. No hay mal que por bien no venga.
4. Mas puede maña que fuerza.
5. A quien se hace miel, moscas se le comen.
6. No hay mejor testigo que el papel escrito.
7. Quien no se aventura, no pasa la mar.
8. Sancho Panza dormia como una piedra.
9. El pobre hombre se echó tierra en los ojos.
10. El Capitan defendió el terreno palmo á palmo.
11. No se meta V. en lo que no le va ni le viene.
12. Cada uno puede hacer de su capa un sayo.

Write a short essay on the liberty of nations.

Candidates for the second-class certificate are to translate the third part of the passage for the first-class, and two letters of business, to render into English six of the proverbs and idiomatic phrases, and to answer some grammatical questions by translating a few examples.

Translate into Spanish :—

Sir,—We are exceedingly sorry to be under the necessity of becoming now urgent, but as you are backward with your remittance, and our profits are so small on the goods we have sent you, we expect an immediate draft or order for the sum which has been so long due, otherwise we shall be obliged to take such measures as must prove very disagreeable to you.—Your humble servant.

Sir,—In answer to your favour of the 6th inst., I shall, by to-morrow's mail, send you a few articles which I shall submit as a specimen of both the quality and cheapness of all my things. Should it be your pleasure to repeat your order, I shall endeavour to prove myself deserving of your favour.—I am, with wishes for your success, yours faithfully.

Translate into English :—

1. La primera casa está para concluirse y la segunda por habitar.
2. V. está equivocado y su amigo tiene razon.
3. Se me olvidó lo que V. me dijo.
4. Heteme aqui, amigo, sin un cuarto y tendré que salir manana.
5. ¡ Desdichado de mí padré ! murió de repente.
6. ¡ Plegue al cieto que nunea seamos tan infelices !

Candidates for the third-class certificate will translate the precedent six examples, the next extract of Nueva Floresta Española, and to render into Spanish some phrases to elucidate a few grammatical rules.

Translate into English :—

Durante el sitio de Gibraltar, en el momento, en que los ingleses esperaban un ataque general, un centinela, que habian colocado al anocherer frente á la torre del diablo, estába á lo ultimo de la muralla silbando y figando sus miradas sobre las lineas españolas, no soñando mas que balas, bombas, minas, brecha y fuego de fila. Al lado de su garita tenia un puchero, donde habia ocultado su comida, que consistia en un potage de garbanzos. Una mona (sabido es que la cima de esta roca está siempre cubierta de estos animales) muy grande alentada par el silencio del centinela, y llevada del olfalo se acerio al puchero y metió la cabeza para regalarse con lo que tenia ; cuando quiso escarparse, no púdo sacar la cabeza, y se llevó el puchero por gorro, marchando con los pies de atras. Esta terrible aparicion apenas se presentó á los ajos del centinela, dando con cuanto encontraba, convirtió al pobre Beltran (la mona) en un granadero español ensangrantado y herido mortalmente. Exaltado con esta idea y lleno de miedo disparó su fusil gritando con todas sus fuerzas, que el enemigo habia escalado la muralla.

Translate into Spanish :—

1. Whoever may be personally at the meeting will be honoured by the acquaintance of the Prince.
2. I shall make up his accounts.
3. He makes himself loved by everybody as much by his modesty as by his merit.
3. However relishing may be the draughts which physicians prescribe, few are the patients that like them.

FREE-HAND DRAWING.

THREE HOURS ALLOWED.

1. Make an outline of the ladder and hamper.
2. Make an enlarged drawing, not less than fourteen inches in length, of the photograph.
3. Draw from knowledge eight muscles of the human body, giving their names, and their origin and insertion.

Directions for the Local Boards.

Put a hamper with the lid open under a step ladder before the candidates in free-hand drawing.

Provide each candidate with a carte-de-visite photograph.

PRACTICAL GEOMETRY.

THREE HOURS ALLOWED.

The constructions must be strictly geometrical, neither calculation nor trial being admissible. All those lines which are essential to a correct solution must therefore appear on the drawing. The figures may be left in pencil provided they are distinct. No deviation from the given conditions will be allowed, nor may a candidate attempt more than two questions in any one section, Whatever number of solutions may be attempted, one half, at least, must be from those of "Solid Geometry."

Plane Geometry.

I.

1. Draw a triangle whose sides are 2, 2·5 and 3 in. respectively, and the circle circumscribing it.
2. Draw a hexagon on a base of 1·75 in., and the circle inscribed.
3. Draw a square of 3·5″ side and within it place four equal circles touching one another and the sides of the square.

N.B. These questions are for displaying neatness and accuracy of execution.

II.

1. Divide a line 3·5 inches long in extreme and mean ratio.
2. Divide the same line so that the rectangle contained by the segments may be of 2 square inches area.
3. Show (without any calculation) a line whose length is $\sqrt{5 \cdot 5}$ inches.

III.

1. Draw a triangle whose vertical angle is 40°, its base 2·5 in., and its sides in the proportion of 2 : 3.

2. Draw a triangle circumscribing a circle of 1 in. radius, and having its sides in the proportion of 2 : 3 : 4.

3. Construct a triangle whose sides are in the proportion of 2 : 3 : 4, and its area 6 square inches.

IV.

1. Bisect the triangle in I. (1.) by a straight line perpendicular to its longest side.

2. Draw a square on a base of 2·5 in., and divide it into 5 equal parts by lines drawn through one corner.

3. Draw a square whose area is half that of the last.

V.

1. Draw a circle of 1·5 in. radius, and from a point 4 in. distant from its centre draw a line, cutting it so that the chord intercepted may be 2 in. long.

2. The centres of two circles are 3·5 in. apart; one has a radius of ·75 in., the other, one of 1·25 in. Draw a common tangent (by construction, not mechanically).

3. Draw an indefinite straight line, and take two points 2·5 in. apart; the one being ·75 in. distant from the line, the other 2 in., and on the same side of it. Draw a circle to pass through these points and touch the line.

Solid Geometry.

VI.

1. Draw the plan of a line 3·5 in. long when inclined at 42°.

2. Draw a line 3 in. long, and figure one end of it 7, the other 18. Find the true length and inclination of the line of which this is the plan. Unit ·1 in.

3. The plan of an indefinite line makes an angle of 27° with the ground line, its elevation one of 40°. Determine the inclination of the line to each plane of projection.

VII.

1. Illustrate the terms "plan," "elevation," and "sectional elevation," by showing those of a pentagonal prism resting on one face. Side of pentagon 1 in.; length of prism 3 in.

2. Draw the plan of a hexagonal pyramid lying on one face, and give an elevation on a line making an angle of 30°, with the plan of the axis; side of hexagon 1 in., length of axis 3·5 in.

3. Draw the plan of this pyramid when one edge is vertical.

VIII.

1. Draw the plan of a cube of 3 in. edge when one face is inclined at 55°, and one diagonal of that face is inclined at 35°.

2. When two edges of one face are inclined at 27° and 37° respectively.

3. When two faces are inclined at 40° and 62° respectively.

IX.

1. The "horizontal trace" of a plane makes an angle of 35° with the ground line; the "vertical trace" one of 50°. Determine the true angle contained by these traces (*i.e.*, when the co-ord. planes are perpendicular to each other).

2. Taking the same traces as in the last, determine the angle that a horizontal line perpendicular to the vertical plane makes with this given plane.

3. The horizontals of two planes make an angle of 40°; one plane is inclined at 50°, the other at 60°. Determine the angle between them.

X.

1. A cylinder 3 in. diameter, 4 in. axis, has the latter inclined at 40°. Determine the section of this cylinder by a vertical plane bisecting the axis.

2. Draw a tangent plane to the cylinder in the last, having an inclination of 60°, and show the line of contact.

3. Draw the plan of three spheres standing on the horizontal plane, and touching one another, their radii being ·75, 1·2, 1·6 in. respectively.

XI.

1. A box 5 in. long, 3 in. broad, 1 in. deep, having three equidistant partitions across it, is made of wood ¼-in. thick. Draw its isometrical projection.

2. Draw the isometrical projection of a piece of wood 5 in. long, 3 in. broad, and ½-in. thick, with a circular hole bored through its centre of 2 in. diameter.

3. Draw the perspective projection of the box in the first question of this section, taking conditions at pleasure, provided that the eye is above the box, and no side of the latter is parallel to the picture plane.

(*To be continued.*)

FISHING TACKLE FACTORY.

Redditch, world-famous for its needles, is equally celebrated for the excellence of its fish-hooks and fishing-tackle. Thirty years ago, Messrs. Allcock and Co. employed about a dozen hands in this trade; now they have upwards of 150 on their books, their premises have been necessarily extended, and they have found it desirable to have a branch establishment (Allcock, Laight, and Co.) at Toronto, Canada West. The manufacture was originally begun by Mr. Samuel Allcock's father, who was also one of the earliest needlemakers in Redditch; but the present head of the firm has had the management and sole control of the works for twenty-two years. Of the history of fish-hook making in Redditch comparatively little is known. The trade appears to have been first followed, not at but near Redditch, by a Mr. Tolly, the date of whose enterprise is not very clear. At the little village of Sambourne, three miles from the Needle Town, Mr. Tolly set up his sign as a maker of hooks, and there he taught the grandfather of one of the largest and most respected of Redditch manufacturers of to-day—Mr. R. Hemming. About ninety years ago, the Mr. Richard Hemming referred to as having been initiated in the manufacture by Tolly, commenced business at Redditch. So the trade spread, Mr. Allcock, sen., being amongst the first to embark in it. Now, the trade gives employment to about 600 persons in Redditch alone, and something like four million hooks are sent out every week to all parts of the globe.

The first process in the manufacture of fish-hooks is very similar to that in needle-making, viz., the cutting-up of the steel wire into the required lengths. The wire intended to be made into hooks is next "bearded," —notched, the untechnical would term it—then filed, and sharpened to a fine point. There is here a difference between foreign and English fish-hooks. The latter are notched, and the former flattened at the end; for fly-making they are tapered, to give them a neater appearance than their rivals possess. The hooks have now to be shaped and bent. They are curved—"bent," as the manufacturers would say—by women, on a "bend," a very simple process, consisting of crooking the wire over a piece of wood. To harden and anneal the steel, hooks go through a similar process to needles; they are hardened in the fire, and tempered in sand, in a pan which has a fire under it. The small hooks are put into bags containing oil and emery, and shaken by hand. After they have been scoured, they are well washed in soapsuds, by which means the oil is removed from them. Next, the hooks are put into sawdust for the purpose of being dried, and subsequently we find them in clean bags, polished as bright as new coins. After being blued, the hooks are once more washed and dried again with sawdust to prevent their rusting, and then finally dried in that material. For this purpose, it is said that dry sawdust is indispensable. Certain sorts of hooks are now ready for papering and packing, done by girls, whose duties include the individual counting of every hook. The variety of fish-hooks is something astonishing. There are made at the Standard Works fifty-three different sorts of hooks, and many of the sorts have from

twenty to thirty sizes. These "loose hooks" include the sorts known as common and best ringed Kirby, flatted and ringed hollow Limerick, hollow-pointed Dublin Limerick, treble-brazed, single and double trimmers, eel and sneek hooks, Kendal Kirby-bent, short-shank Kendal, Carlisle round, Norway hooks, black fish-hooks, Kirby and round bent Sea, Exeter Sea, blue and tinned, &c. Of these the most popular are the Limerick, sneek, the hollow-points, the Kirby, Carlisle, and Kendal hooks.

Quite as important as the manufacture of hooks is the fishing-rod department, where every description of rod is made—from the lowly two-jointed "hazel," at three shillings a dozen, to the aristocratic salmon rod, at three sovereigns. The best rods are variously made of bamboo, hickory, and East India cane, with ash for the bottom joints. Hickory is used for the second and middle joints of the best rods, with tops of lance-wood and bamboo. There are fly-rods made of all hickory—others for spinning, of cane, which is imported from South Carolina and from the East Indies. After leaving the saw-mill, the wood is turned into joints, the butts of which are then bored to contain spare joints, and then planed ready for the fitting-on of the brass ferules, the best of which are hand-brazed to give them great strength. Certain of the rods—those for use in Irish waters especially—are screwed together, not merely placed in the sockets. That beautiful appearance which fishing rods present is obtained by staining the wood with aquafortis and nut-galls. The stain is burned in immediately after it is put on; the rods are then rubbed with sand-paper, and highly polished—a dozen coats of varnish being not at all unusual. The waxed silk which binds the tops of the joints, and the rings through which the line runs, are put on by hand, and the rods undergo another varnishing as far as the rings are concerned.

Fishing floats form another department. The cork of which they are made having been cut with a hand-knife, is pierced with hot wire, and then is ready to be turned by a machine to any size or shape required. They are put on a grindstone to have the knife marks taken out, and then painted and varnished by children. Before the float is complete, it has gone through twenty-one pairs of hands; yet the dealer in tackle may purchase a gross for fifteen shillings. So simple an article as a float is not made without wood, cork, wire, putty, silk (for binding one end), quill, paint, and varnish. The reels for lines are all cast and finished like other brass objects, and require no description; the swivels used in trout and pike fishing are stamped like needles, one by one, filed and drilled, and finished in the same way as the hooks. Leads for sinking hooks and nets are made on the spot in moulds; the small shot used for general lines are split by a splitting machine. The shot is put into a trough containing one hole, and let drop on to a circular knife turned by machinery. Besides the tackle which has been mentioned, they make lines at the Standard Works—hair lines being spun, without any knot, in one length; and the better lines plaited at a machine by girls. Like the cork, all the "gut" used is imported from Spain, and is looped and tied on with wax thread. "Fly" making—one of the most important features of the manufacture—deserves more space than can be given here, and, after all, can only be understood by being seen. The hooks are first tied on to the gut; then the body of the fly is made; the hackle is next put on, and then the wings—girls, whose aptitude is great, and their artistic powers not inappreciable, having sole sway in the fly-making department. Of course there is a great demand for the material wherewith to make the much-sought-after flies. Some of the feathers used at Redditch for this purpose come from America, others from Germany, but our own feathered tribes are laid under heavy contribution. More useful to the artificial fly-maker than the vocal portion of their tribe are jays, starlings, woodcocks, and golden pheasants. There is a warehouse, 65 ft. by 18 ft., full of patterns for home and foreign markets, and the whole establishment bears marks of the great care bestowed upon it by the energetic gentleman (Mr. Samuel Allcock) now at the head of the firm.

INDIAN ARCHITECTURE.*

Nearly three years ago, Mr. Fergusson read a paper on this subject in the Society's rooms (see *Journal*, vol. xv., p. 71), when the Under-Secretary of State for India presided. Mr. Fergusson's object was to advocate the preservation of Indian architecture, and awaken an interest in this country, so that the government of India might be led duly to appreciate the buildings in their charge. Mr. Fergusson's teaching has at last borne its fruit, and some quite practical measures have been taken to give effect to it. The Society may be congratulated that in this matter, as in many others, it was the earliest to take the lead in promoting a very useful public object.

In a recent number of the *Times*, the proceedings which have taken place in reference to Indian architecture, and a full account of what is now doing and intended to be done by the several authorities—the Secretary of State for India, the Government of India, and the Science and Art Department—are stated, and will interest the members:—

"The hilly tract of country surrounding the native village of Bhilsa, in Central India, is covered with a number of curious ancient ruined monuments, which years ago attracted the attention of General Cuningham, and gave rise to his archæological treatise called the "Bhilsa Topes." A new interest for the subject has lately been created by Mr. James Fergusson's beautiful series of photographs in his work on "Tree and Serpent Worship," which illustrate the most perfect of the remains near Bhilsa—the Sanchi Tope.

"This monument consists of a huge dome or mound of earth faced with stone, and stands in solemn loneliness on the summit of a small hill overlooking the few scattered native huts of Sanchi. The village is in an isolated part of Central India, seventy-seven miles from the nearest English cantonment—Saugor, and twenty miles from Bhopal, the capital of the native state of that name. The surrounding country is covered with ancient ruins, which, like the Druidical stones of Great Britain, are but the records of a past age and an almost forgotten people. Small hills dot the not too well cultivated plain, and the merest tracks, the only substitute for roads, wind across river and jungle, between the small villages which are sparsely scattered about.

"As one of the earliest monuments erected by the worshippers of Buddha, the Sanchi Tope claims the special interest attaching to the history of a religion which originated more than two thousand years ago in Upper India, and, after rising to ascendency throughout the country, spread its doctrines to Thibet, China, Japan, Ceylon, and other countries east of Hindustan. It has long since ceased to be the governing religion of India, and at the present time has no followers in that country. If, however, we wish to study the history of a creed which in other parts of the world has upwards of 200,000,000 votaries, it is to India that we must look for the means, which exist in the various Buddhist monuments scattering the country in ruined heaps. At different times a certain amount of interest has been taken in the translation of inscriptions, and archæologists have from time to time brought to light new facts which have given some insight into the history of Buddhism.

"It is not, however, until we come to study its stone sculptures that a more complete idea can be formed of

* "Illustrations of various Styles of Indian Architecture;" a series of 15 photographs of some of the most important buildings in India erected between B.C. 250 and A.D. 1830, with a lecture on the Study of Indian Architecture, read at a meeting of the Society of Arts on the 19th of December, 1866, by James Fergusson, F.R.S., and a report of the discussion which ensued. London, printed for the use of Schools of Art in the United Kingdom, 1869.

the growth of that wonderful religion, and the circumstances under which it gave birth to an art full of character, beauty, and a quaint originality of its own.

"The public is on the eve of being awakened to this interesting study, and we hear that the government of India has deputed a young officer of Engineers to organize a party of modellers, for the purpose of taking plaster casts of some of the most remarkable Indian sculptures. We understand that the first cast is to be one of four great gateways which surround the tope of Sanchi. It is a large work, requiring expedition, in order that the limited cold season, when such work is alone possible, may not expire before the whole is completed. The party about to be employed will consist of three Sappers of the Royal Engineers specially trained in England, and some eight native modellers, who will proceed to Bhilsa and remain encamped there until one cast has been obtained. The party, after reaching Calcutta, will travel by railway as far as Jubbulpore, and there collect the necessary camp equipage for crossing into the Bhopal dominion. It may be imagined that a march over 185 miles of rough country without a road is not without its difficulties, especially when the materials for casting a large monument have to be conveyed on carts drawn by bullocks. We can picture the long string of waggons slowly moving from Jubbulpore to Saugor, and thence to Sanchi, halting each day after the usual march of 15 or 16 miles, and forming an encampment for the night near some village, where water for man and beast is plentiful, and where the native drivers can buy and cook their meal of rice and flour.

"Country produce is often thus transported from town to town, but it will be perhaps for the first time that an expedition passes through this part of Central India, having for its object the instruction of the natives in their ancient art, and the enlightenment of Europeans in the history of a people who, some thousand years ago, raised huge religious monuments to the memory of their great teachers, and in dedication to the Supreme Buddha.

"The Tope at Sanchi was probably of a dedicatory character, and appeared to have been erected about 500 years B.C. The stone railing was probably built about 250 years later, by a number of religious devotees, and in the commencement of the Christian era the four great stone gateways were erected. Each of these is 33 feet high, and covered with the most elaborate and artistic sculptures. The whole surface is divided into panels, containing bas and alto reliefs, representing domestic and warlike scenes, processions, and modes of worship, forming, in fact, the most perfect existing record of early Buddhist history.

"There are three, perhaps four, distinct races of people represented in these sculptures; of two there is no difficulty in recognising one as Hindoos, meaning the civilised race who, at the time of the erection of the gateways, were the occupiers of the valley of the Ganges, and who had for 2,000 years before that time been the dominant class in India. The second race are described by General Cuningham and Colonel Massey as priests or ascetics, but Mr. Fergusson affirms that the sculptors meant to represent them as the aboriginal inhabitants of the country of Malwa, to whom the Hindoos came either as conquerors or as missionaries. Although a careful study enables anyone to discriminate between the different races of men represented, the task is more difficult when we attempt to determine what each bas-relief is intended to represent. One half of the bas-reliefs represent religious acts, dagobas, trees, once or twice the wheel, and once the serpent figure as objects of adoration. Some scenes depict events in the life of the great Sâkya Muni, and numbers are representations of domestic life, in which it is hopeless to try to identify the actors. The more important bas-reliefs represent historical events, and, considering the self-denying character of Buddhism, it is probable that the events represented had passed into the sphere of religious history before they were sculptured, and that they were actions sanctified by tradition. The whole of the inscriptions record gifts, and gifts only, and are, therefore, no guides to the meaning of the sculptures. It would, however, seem probable that Asoka is the chief hero in all, or nearly all, the historical bas-reliefs.

"The sculptures at Sanchi are rude, but they make atonement by their vigour, and by distinctness of expression. All the people represented are human beings acting as men and women have always acted, and there are none of those monstrous combinations of heads of men with those of elephants, or lions, or boars, which form the staple of modern Hindoo sculptures, and which are more usually brought home from India.

"Mr. Fergusson says:—'Perhaps, however, the crowning point of interest in these sculptures is, that they complete our knowledge of the history of stone art in India. Hitherto we have been groping our way backwards with uncertain steps, never knowing at what conclusions we might ultimately arrive. As far back as the tenth or eleventh centuries, we had abundant examples of structural buildings, and we found that each was perfect in the direct ratio of the age. The history of art in India, so far as we could trace it, was written in decay, and, finding each example more perfect than the one that followed it, there was reasonable hope that some day we should find something that would stand comparison with the arts of the Western World.'

"Sanchi is in the territory of the Begum of Bhopal, and this Mahommedan Princess, with little personal interest in the Buddhist or Hindoo relics of her dominions, had nearly permitted the removal of one of these gateways to Paris. The timely interference of the Indian Government happily prevented such a catastrophe, and a pledge was given to send a plaster cast in place of the original, All archæologists must concur heartily in the policy of retaining ancient Indian monuments *in situ*, and we hope they may look forward to the time when the government will also keep the chief ones in repair.

"Besides the cast of the Sanchi Gate, about to be sent to France, the Science and Art Department has requested that three copies may be supplied, for London, Edinburgh, and Dublin. Prussia, also, seems anxious to secure a copy, and it is probable that other European countries will follow suit.

"Until the late Disraeli Administration, the subject of Indian architecture has been greatly neglected by both India and England, and one of the most active steps towards creating an interest worthy of the subject was taken by Sir Stafford Northcote himself, when Secretary of State for India, by moving the Indian Government under Sir J. Lawrence to take action. Up to this time, General Cuningham and Mr. James Fergusson were among the few writers who had enlightened us with any success on the subject; and although the latter often protested against the barbarity of desecrating ancient Indian buildings by turning them into barracks, and by the use of them, when whitewashed, as government offices, no steps had been taken either to make records of, or to preserve the architecture of India. Now, however, we hope in a short time to have a complete series of illustrations of both archæology and architecture, as official published documents inform us that a survey party has been established in Bengal, Madras, Bombay, and the Upper Provinces, and that plans, photographs, and plaster casts are being prepared of some of the most remarkable Indian buildings. A step so liberal cannot but succeed in its objects of educating natives, and adding to the scanty and imperfect knowledge of Indian art in Europe, and we trust that the results will justify Government for taking the initiative in a matter which more commonly depends on private liberality for support.

"Last year, towards the close of the season, when Englishmen are allowed the privilege of travelling in the Rajah of Cashmere's dominions, a somewhat rapid survey was made of some of the most important ancient Cashmerian temples, and a series of photographs and

plans will, we believe, be among the first series of illustrations to be published by government. The Cashmerian style of architecture is very remarkable, and sometimes suggestive as regards modes of treatment in external decoration. The style is unlike anything to be met with in other parts of India, and appears to have had some connection with that of Greece. In the case of Cashmere it is well that records have been made before the ravages of climate—snowdrift, torrents, extreme heat and cold—complete the ruin commenced by the bigoted Mahommedans after their conquest of the valley.

As a first step towards making the study of Indian architecture accessible to the Schools of Art in the United Kingdom, the Science and Art Department have printed a small book, which contains 15 photographs of some of the most important buildings in India, erected between the years 250 B.C. and 1830 A.D, so that the student is offered an opportunity of studying some of the examples marking the progress of an art which had a splendid existence for a period of 20 centuries. These photographs are permanent, being printed by the new Woodbury process.

"This little work opens with a photograph of the Sanchi Gateway, which we have alluded to as about to be reproduced in plaster of Paris. We are then shown two views of a Cashmerian Temple, superstitiously believed by the natives of Cashmere to have been erected by a race of giants. Hindoo, Jain, Mahommedan, and modern buildings then follow, showing how the peculiarities of each style have been kept distinct, and demonstrating that the greatest architectural successes are those in which the style has grown out of national wants allied with national character and instinct. The book ends with a paper read by Mr. Fergusson at a meeting of the Society of Arts, and in it we are told of the importance of the study of Indian architecture, as affording a direct means of ascertaining the ethnological relations of the different races inhabiting India, as giving the best pictures of the religious faiths of the country, as furnishing a means for testing any historical conclusions we may arrive at, and as giving a measure of the greatness or decay of the dynasties that ruled in ancient times.

"Then, as bearing on architectural art in our own country, Mr. Fergusson tells us that such a study helps to widen the base of our observations, and extends our views to styles wholly differing from our own, enabling us to master principles which are wholly hidden when our study is confined to local styles so mixed up with adventitious associations as ours inevitably are.

RECREATION AND EDUCATION.

At the Church Congress, held at Liverpool, the following discussion took place on the great importance of providing recreation for the people:—

The Rev. J. Erskine Clarke said the subject was not one which he should have chosen himself; and the evils flowing from the present recreations were so vast, and so comparatively little could be done to mitigate them, that he was afraid the subject would fall under the common censure that it would lead to no tangible action. After pointing out the instructive distinction between recreation and pastime, viz., that recreation was a creating anew of fresh strength for coming work, while pastimes were devices for the passing of time away—he said that by the people he meant the rank and file of labour's army. That the poor were not worse than the rich in the viciousness of their pastimes was proved by the manner in which horse-racing, pigeon-shooting, &c., were pursued, the popularity of such dramas as "Formosa," &c., and he by no means wished to imply that the recreations of princes and nobles were wholly commendable. Limiting his subject to the indoor recreations of the people in towns, where there was the greater need of wholesome recreation and less chance of obtaining it, he proceeded to comment on the prejudical influences exercised by the public-house, the music-hall, dancing saloons, and the theatres. He said the public-houses did nothing for the recreation of the workman, but much to debase him, and absorb the money which would procure him healthful pleasures; the evils of the music-hall were illustrated by an extract from Mr. Greenwood's "Seven Curses of London." With regard to dancing saloons, he said, the apparent impossibility of excluding drink, and the licence allowed by parents, seemed to make them useless in large towns as a source of recreation for the poor; the presence of the clergy was absolutely necessary to ensure anything like decorum, and it almost appeared that the recreation of dancing in our towns was so vitiated that it must be abandoned. The theatre was especially the recreation of the poor, but, as it was at present represented, it was no true recreation. It was closely linked with drinking and licentiousness, and the plays of the so-called high-class theatres that were most popular were vicious and immoral; while the "penny gaffs" of the poor acted on their boards the "blood and murder" tales so attractive in the cheap vicious literature of the million. He thought it a matter well worthy of the attention of the benevolent that they should try to elevate the drama, by the experiment of putting a theatre under the firm supervision of a committee, such as that which managed the Polytechnic Institution, London, severed from drinking and licentious temptations; such a theatre might not only afford harmless but healthy recreations; while the theatre as at present existing was of the most fearfully depraving character. In the course of a few practical suggestions he urged that they should do what they could to improve public opinion as to what recreation was; let both the clergy and the press plead for the recreation of the people as a part of religious duty. A love of music was no sin; and a hearty laugh was no sign of depravity; and it ought to be felt that God did not provide all the bright things of the earth for those who despised and disobeyed Him. Let them keep bringing the fact before the public that strong drink was the worst foe in this land at the present time to the real recreation of the people. Much of the money wasted in indiscriminate alms, which often directly leads to drinking, could be profitably applied to the establishment of well-conducted places for the amusement of the people. And it was worthy of a trial whether the real recreation of the people was not to be found in the church itself, as well as in the Sunday-school, by simple but attractive week-night services. In conclusion, he urged that both the clergy and laity should "tackle" the subject in thorough earnest.

The Rev. J. C. Chambers read the next paper. He contrasted the spectacles and games provided in the past by heathen governments with the almost total neglect of such provisions in the present day, when commons and waste lands were being enclosed without any regard to the recreation of the inhabitants of the country. Christianity sanctioned the doctrine that amusement ought to be to the life of the man what salt was to food. While reminding his hearers that religion was never intended to make our pleasures less, he said it must be confessed that we had greatly fewer means of amusement than our forefathers, instancing the long list of sports mentioned by Burton in his "Anatomy of Melancholy." It was quite evident that the people were not to be won over to goodness by sour asperity or unsympathising disdain, and he urged the formation of institutions partially of the nature of the clubs of the upper classes. It was not by setting their faces against all recreation that they could hope to raise the present standard, but, by energetically seeking to purify the present so-called recreations, they might do a great deal to bring back the days when the land was known as "merry England," and at the same time do much in the service of religion.

Mr. James Cropper urged that the spare time of the people was that in which those who most loved them

could best and most influence them. He spoke strongly in favour of railway excursions, having often seen the advantages they afforded. The laxity which was frequently observed in penny readings resulted mainly from the fact that the direction was vested in a committee instead of one person; and he argued that penny readings should not be ventured upon unless one person had the entire management; though, in the abstract, everything was to be said in favour of making music and reading popular.

Captain H. Toynbee, Rev. Mr. Scott, Mr. J. F. Watson, Rev. W. Glaisher, the Archdeacon of Ely, Rev. James Irving, and Rev. Rector Griffiths followed. The Venerable Archdeacon Denison spoke strongly in favour of harvest homes. He did not feel at all horrified at dancing, and in his own parish he very much wished he could have joined a recent dancing party. He also advocated cricket between the services on Sundays. The Rev. N. Lorainé strongly dissented from these views.

The discussion then closed.

At the same meeting, Mr. Alderman Hubback, of Liverpool, read a paper:—He said that, in his address, he should chiefly devote himself to the subject of elementary education, by which he meant the ability to read with ease and intelligence, to write with some degree of facility, and to know the simple rules of arithmetic, coupled with such acquirements as would fit children when they grow up to lead a proper life. They should, at the same time, have a moral and religious training, be taught to love and fear God, to love their fellow creatures, and be schooled in industrious and cleanly habits. At present, the ignorance prevalent amongst the great mass of the people was the most fruitful source of crime and poverty—a disgrace to us as a Christian nation, and a scandal to the Constitution under which we are governed. The people ought, in his opinion, to be educated at all hazards, and, at any rate, efforts ought to be made, without further delay, to materially lessen the gross ignorance now so universal. To effect such an object, the work must be undertaken in a thorough spirit; that is, the mind of the nation will have to be made up that, at all costs, the rising generation shall for the future be properly instructed in their duty to God and man. All narrow, bigoted, and sectarian proclivities must be given up, our individual responsibility must be fully realised, and everyone interested in the subject ought to unite and call upon the Legislature to assist them in grappling with this vital subject, and that without delay. A portion of the prevailing ignorance was due to inefficient masters and mistresses, and the fact that schools were not made attractive. Schools thoroughly efficient ought to be erected throughout the land, children ought to be compelled to attend them, and parents to pay the requisite cost, and, if they refused, to be fined, and their children to be sent to industrial schools. But, first and foremost, there ought to be appointed a qualified and responsible Minister of State, with a seat in the House of Commons, who would have charge of the education of the people. He would have to divide the country into districts, with a head inspector in each, together with a board of education elected by the ratepayers, with sub-inspectors of various grades, according to the requirements of the population. As to religious matters, he (Mr. Alderman Hubback) would suggest that the management of existing schools, in respect to their connection with the various religious bodies, should be interfered with as little as possible. He was strongly in favour of the denominational system, but would make secular education the sole test upon which government aid is granted. Industrial schools should also be largely increased, and it should be the duty of the inspectors to compel the authorities to provide the necessary accommodation for the complete education of their districts. "In order to procure good masters and mistresses—who ought to know each of their pupils individually—a provision in the shape of a superannuation allowance for their old age should be granted; for the present condition of teachers prevents them from saving, and they have now nothing but the workhouse before them when they are obliged to rest from their labours. In fact, everything connected with the progress, position, and prosperity of this country must, in a great measure, depend upon the manner in which the rising generation are instructed."

HOSPITALS AND ASYLUMS IN FRANCE.

A full report has lately been made by the inspectors-general of charitable establishments, and has been printed and distributed by order of the Minister of the Interior. The following is a *resumé* of the general facts contained in the report:—

The funds placed at the disposal of these establishments since the commencement of the present century have been very large, and great efforts have been made to increase the extent of accommodation, and to improve the system of management. The gifts and legacies, which amounted to less than two millions sterling in the time of Louis Philippe, have nearly doubled since; between the years 1852 and 1868, the funds received for charitable purposes amounted to £3,260,000. The sums voted by the communes have also considerably increased, having risen from £332,305, in 1847, to £568,034, in 1864. The municipal council of Paris votes an annual subvention of £351,492; Marseilles, £23,720; Rouen, £18,880; Bordeaux, £16,800; and Nantes, £15,200. The hospitals have also benefited largely by the general increase in the value of land and house property. The annual income of the Paris hospitals from this latter source amounts to £133,100, Lyons about half as much, and other great towns in proportion. The total amount devoted annually in Paris alone for all kinds of charitable purposes has risen from £320,000, in 1804, to £815,254, at the present time.

Previous to 1790, there were 1,224 hospitals and asylums existing in France; the number is now 1,557. These 1,557 establishments contain 141,576 beds, and receive more than half a million of persons annually, either as patients or pensioners. Paris possesses 18,785 beds; Lyons, 4,176; Nantes, 2,716; Lille, 2,188; Rouen, 2,073; and Orleans, 1,641.

The increase in the funds devoted to such institutions has been divided between the erection of new and the improvement of old hospitals and asylums. Of these, 115 have been entirely rebuilt since 1852, and all the others have either been enlarged or improved, or are being placed on a much more efficient footing than formerly. Amongst the most important ameliorations may be mentioned the greatly-improved supply of water; the creation of separate buildings for contagious diseases; the formation of gardens, and the introduction of vapour baths, douches, and other means of cure; libraries and reading-rooms; and isolation of the schools attached to asylums. The work of reconstruction and improvement is still carried on with energy, not only in Paris, where the historic Hôtel Dieu is being completely rebuilt on a grand scale, but also in many other places.

The report is not confined solely to existing hospitals and asylums, but deals with other very important questions connected with the succour of the unfortunate, such as what is called *domicile de secours*, that is to say, the difficulties which surround the admission of rural poor into the asylums, and the very important one of home medical assistance, which the reporters desire to see developed side by side with the treatment in hospitals of those who are without families.

The directors believe that a complete reform is required in the existing law. They propose—1. To make the communes answerable for their poor, as in Belgium. 2. To unite the hospital and charity bureaux under one administration. 3. To connect with the indoor service of the hospital the medical visitation of the poor at home, as in England.

Another, and a very sensible proposition is put forth, namely, that as when an architect has to erect an

hospital or asylum, he has often to make long and expensive journeys in order to study what best fits the requirements that he has to meet, the directors propose to collect plans of all the best hospitals and asylums in France and other countries and deposit them at the offices of the Minister of the Interior.

Fine Arts.

Exhibition at Rheims.—The Society of the Friends of Art, in the famous old city of Rheims, organised its first exhibition of works of art with great success. The place of exhibition was the circus, which the authorities of the city placed at the disposal of the society. The pictures were arranged around the interior of the building, while the drawings and sculpture were placed in an exterior gallery. Here is also a collection of the works of the pupils of the schools of design in the district. The society has achieved a great success; the collection of pictures is large, and the list contains the names of a considerable number of the first artists in France, although the exhibition was got up somewhat hurriedly. The works sold amount to 45,000 francs.

Monument to Lamartine.—The Council General of the Saône and Loire has voted the sum of 5,000 francs towards the statue to be erected in memory of Lamartine, by the town of Mâcon. This sum, with what is already in hand, will enable the projectors to raise a worthy memorial to their famous townsman.

The Ink-stained Sculpture at the New Paris Opera-house.—The great blotch of ink has been entirely removed from M. Carpeaux's "dancing figure," as well as from the group in the Luxembourg Gardens, but the sensation caused by the act of vandalism has scarcely subsided. A writer, who signs himself "An Enemy of Debauchery," has sent a letter to the *Gaulois*, in which he says, that in spite of all the precautions that may be taken, the group will be destroyed,—that air-guns, for instance, are very effective; and he adds that he and two other persons have sworn to destroy so indecent a work. The letter is probably only a silly hoax.

Manufactures.

Indian Cotton.—The *Times of India* says:—For some reason or other, which ordinary minds cannot comprehend, the report of the Cotton Commissioner, Bombay Presidency, for the year 1868-69, has not yet been published, and may, perhaps, not be published till the information embodied therein shall have lost its current interest. The government resolution thereon has appeared, however, bearing date the 6th instant, and from it, meagre as it is, a few gleanings may be made. Financially, the department prospered during the year under review, its receipts having been 2,73,889 rs., against an expenditure of 2,59,611 rs., leaving a balance of 14,278 rs. This, added to the balances of former years, gave a net cash balance, on the 1st of January last, of 1,71,656 rs. Proposals for increased establishments are held in abeyance, pending the re-organisation of the department, on the passing of the new Act, when the above large balance, raised under the working of the Cotton Funds Department, will be utilised, as it ought now to have been, for the advancement of cotton cultivation in the presidency, and the improvement of the staple. A proposed fee of four annas per bale, in place of three, as at present, will not, we trust, be necessary, as aid will be given from imperial funds, which has not hitherto been done. In all, 1,294,291 bales were exported from Bombay, Kurrachee, and Carwar during the year, being 70,241 in excess of the quantity exported in 1867. The cultivation of cotton extended over 2,165,714 acres, being a decrease from 1867 of 15,460 acres. The deficiency in actual produce for 1868 is estimated at 78,154 bales, accounted for by decrease in acreage, and the badness of the season. Drought affected the presidency generally, and blight the southern Mahratta country. The penal provisions of the Cotton Frauds Acts are condemned as being utterly insufficient; the Act, as it stands at present, is considered as a sort of scarecrow, of the harmlessness of which dishonest traders have repeatedly satisfied themselves. If the trade is to be protected at all by special enactments, as its best friends consider desirable, fresh legislation is absolutely necessary, police supervision being confined to the presses, where most of the cheating is carried out. The establishment of additional facilities for the transaction of business at the cotton marts is expected to be productive of good results, as it must necessarily be. The resolution makes reference, but that is all, to the systematic experiments that are now being made with the different varieties of cotton, under practical and trained supervision; but what those experiments are there is nothing in the document to give the least idea. Luckily, those interested in the subject do not need the information; but it might have been supplied nevertheless. The following is an extract from the government resolution above referred to:—"Several proposals for increased establishments have been submitted, and it has also been suggested that the fees should be increased from three to four annas per bale. The consideration of these proposals may be deferred, pending the thorough reorganisation of the department, which will be effected on the passing of the new Act. In all, 1,295,291 bales were exported during the year from the three ports of Bombay, Kurrachee, and Carwar. This number is 70,241 in excess of those exported in 1867, which was stated to be the year in which the greatest quantity had, up to that time, been exported—Bombay, 1,240,692; Carwar, 25,363; Kurrachee, 27,206; total, 1,294,291. The cultivation of cotton extended, it is said, over 2,165,714 acres; last year (including Kolapoor and the other native states in the southern Mahratta country, the Maheekanta and Rewakanta) 2,181,174 are reported to have been cultivated, showing a decrease of 15,460. The deficiency in actual produce is estimated at 78,154 bales, a quantity quite out of proportion to the difference in the area of cultivation. The deficiency is mainly attributable to the badness of the season. The crop suffered much from drought throughout the presidency, and in the southern Mahratta country was subjected to heavy loss from blight. The officers of the department are unanimous in condemning the utter insufficiency of the penal provisions of the Act. Only eight convictions were obtained during the year. For police purposes, the Act may be said to be inoperative, and now that its imperfections have become widely known, the terror once inspired by it in the minds of the ignorant but dishonest trader is rapidly disappearing. Adulteration and fraud seems to be on the increase, and notably so at Broach. If the cotton trade is to be protected at all by special enactment, it is clear that the present law must be revised, and that, too, without delay. It is sufficient to remark that police supervision, to be effectual, must mainly be confined to the presses. The establishment of markets will doubtless afford much facility to the trade, and will tend to fair dealing. Government are glad to learn of the success that has attended the efforts in this direction at Julgaum and Barsee, and hope that similar success may be met with at Broach and Sholapoor. Very important results may be anticipated from the systematic experiments that are now being made, in different parts of the presidency, with varieties of cotton, under the supervision of the practical men whose services have recently been secured. As yet, there has not been sufficient time to judge of the success or otherwise of these experiments. Mr. Hewett appears to have met with marked success in his attempt at cultivating indigenous cotton, in a description of soil not hitherto supposed to be adapted to it."

Commerce.

The Government Telegraphs in France.—A few remarks will serve to illustrate the manner in which government control over the telegraphs in France is exercised, for the convenience and benefit of the public. After the 1st November next, the charge for a message from any one port of France to another will be reduced from 2frs. to 1fr., or to something under one shilling. The reduction of the uniform rate of 1fr. was enacted by the Chamber of Deputies in July, 1868; but more than a year has been required to make preparations for the increased correspondence which is expected to ensue on the increase of facilities and diminution of charge. Besides the construction of numerous branch lines, the Morse instrument has been replaced by the Hughes' printing apparatus at all the important stations. The use of Hughes' apparatus doubles the rapidity of communication, in other words, will enable twice as many messages to be forwarded in the same time. The number of offices has been greatly increased; it now amounts to 2,701, of which 1,071 are government offices, the remaining 1,000 being at railway stations, whence messages are forwarded according to an arrangement made with the government. No difficulty is experienced in obtaining the required number of signallers. At the last examination 230 were admitted. At present the French telegraph extends over 25,000 miles of line, and the number of messages annually amounts to 3,500,000. In the year 1865, according to Mr. Bright, the United Kingdom possessed 16,000 miles of line, over which 4,650,000 messages were forwarded. The principal improvements effected by the French government, within the last few years, may be briefly enumerated:—1. Reduction of the charge to the uniform rate of 1fr. 2. The introduction of Hughes' printing apparatus, improved by the late M. Froment, who rendered the instrument workable, which it was not previously. 3. A new and very efficient organisation of the pneumatic system, by which messages are forwarded collectively from the centres of various districts to the centres of other districts, instead of transmitting the messages successively, or one after the other, as was formerly the case. 4. The introduction of Meyer's instrument, which forwards a *fac-simile* of the message received, and thus renders any error on the part of the telegraph impossible.—H. G.

Commerce of France.—The import and export accounts for the first six months of 1869 have recently appeared. The following are the most remarkable items of information:—The value of the foreign goods entered for consumption is set down at 1,442,000,000 francs, which was 30,000,000 more than in 1867, but considerably less than last year, when the amount was 1,668,000,000. The deficit, however, was accidental, and would have been converted into an increase of 43,000,000, but for the late good harvest, which caused the import of cereals to fall from 296,000,000 to 27,000,000. The following is a list of the most important items of import and consumption:—

	Francs.
Sugar	45,000,000
Coffee	37,000,000
Cattle	51,000,000
Oil	25,000,000
Flax	130,000,000
Silk	171,000,000
Cotton	159,000,000
Oleaginous seeds	34,000,000
Timber	69,000,000
Coal	59,000,000
Indigo	23,000,000

As regards exports, there appears, according to the estimated values, a decided advance. The following are the totals given:—

	Francs.
1867	1,367,000,000
1868	1,352,000,000
1869	1,552,000,000

The chief items are:—

Woollens	131,000,000
Silks	234,000,000
Cotton goods	52,000,000
Prepared skins	37,000,000
Mercery	85,000,000
Articles of clothing	37,000,000
Refined sugar	34,000,000
Chemicals	24,000,000
Cereals	38,000,000
Wine	170,000,000
Spirits	40,000,000
Butter	35,000,000
Silk	78,000,000

The exports of wine exceed in value those of 1868 by 34,000,000, and of 1867 by 44,000,000 francs, the quantities being, in 1868, 598,000 hectolitres, and this year 829,000 hectolitres. During the six months, the customs receipts amounted to 8,739,000 francs, being 2,750,000 francs over 1868, although there was a diminution under the head of cereals amounting to 3,500,000 francs. Sugar yielded 23,500,000 frs., in lieu of 18,500,000 frs. last year. Woollens show an augmentation of 500,000 francs; coffee a slight falling off.

Colonies.

Progress of Victoria.—A very interesting statistical paper, on the religious, moral, and intellectual progress of Victoria, up to the close of 1868, has been issued from the Registrar-General's office, and presented to Parliament, by his Excellency's command. From it we gather that there are 1,006 churches and chapels, 331 school-houses, and 537 dwellings, or public buildings, making a total of 1,874 buildings used for public worship. The number of services yearly is 151,003; there is accommodation for 271,753, but only 167,894 avail themselves of this on the Sabbath. The number of graduates in the Melbourne University during the ten years ending 1867 is 221. There are 1,385 schools, and the number of children attending them amounts to 91,336; of these 48,374 are males and 42,962 females, having 1,261 male and 2,852 female teachers. The common schools, numbering 779, receive about £230,979 annually. There are 1,082 Sunday-schools in the colony, the average attendance being 77,282, in proportions of 37,681 males, and 39,601 females. The National Museum was visited by 67,954 persons. There are 76 mechanics' institutes and public libraries in the colony, containing 134,067 volumes, and 767,933 visitors availed themselves during the year of the benefits offered by these institutions. There are 26 hospitals in the country, giving in-door and out-door relief to 47,470 patients. There are six benevolent asylums, affording relief, in-door and out, to 40,846 destitute people, and there are six orphan asylums, which take charge of 1,022 of the waifs and strays of humanity. £30,858 are annually raised in the colony from private contributions in aid of its hospitals, £10,000 in aid of its benevolent asylums, and £6,370 for its orphan asylums; all this is independent of the public grant in aid. The Melbourne Ladies' Benevolent Society relieved 3,783 persons, at a cost of £5,074; a similar institution at Geelong relieved 993, at a cost of £1,368; the Jewish Philanthropic Society relieved 146 persons, at a cost of £146; the Magdalen Asylum, at Abbotsford, expended £4,622, and the Refuge in Madeline-street, expended £659; the Industrial Schools at Princes'-bridge, Sunbury, Geelong, and the Naval Training Ship expended £45,782 in the reclamation of the forsaken and the precocious viciousness of the colony. £1,899 was spent by

the Deaf and Dumb Institution, in imparting education to these afflicted ones; and 1,680 lunatics cost the country £61,849 for their care and maintenance.

Notes.

APPEARANCE OF THE CATTLE DISEASE IN FRANCE.—The *fièvre aphtheuse*, or mouth disease, has made its appearance in some of the cantons of the Vosges; it is said to have been imported by the dealers who purchase cattle in Alsace and Switzerland. Several cattle fairs have been interdicted on account of the appearance of the disease, and stringent means are being taken to arrest the spread of the evil. The appearance of the disease at the present moment is peculiarly unfortunate, as the season is approaching when large numbers of cattle are collected in farms around the beetroot sugar works, and the consumption of pulp by the animals is one of the elements of success in sugar-making. Of late years, in order to avoid the great expense of carting the fresh beetroots to the sugar-houses, and afterwards the pulp back to the farms, great rasping establishments have been set up amidst the farms themselves, where the juice is extracted from the roots on the spot, and only the former conveyed to the sugar-houses; in some cases the juice is conveyed for miles in iron pipes laid in the ground. Of course this system brings a large number of cattle together on one spot, and thus the calamity of the appearance of such a disease would be increased in proportion.

NAVAL SCHOOL IN FRANCE.—It is said that the French Government is about to establish a great central school in Paris for the instruction of youths intended for the navy and mercantile marine. The education will not only include navigation and all connected with it, but the pupils will also receive a thorough commercial education, so as to render them fit for employment in any part of the world.

LIGHT-HOUSES.—A French writer calculated that, at the commencement of 1867, there existed in the world 2,814 light-houses, or *phares*, of more or less importance, viz., 1,785 on the coasts of Europe, 674 on those of America, 162 in Asia, 100 in Oceania, and 93 in Africa. As regards Europe, the best lighted coasts are those of Belgium, France following immediately afterwards. Then come, in the order in which their names are given, Holland, England, Spain, Prussia, Italy, Sweden and Norway, Portugal, Denmark, Austria, Turkey, Greece, and finally Russia. Besides Europe, the best lighted coasts are those of the United States, which have one light for every twenty miles, whilst the Brazilian coast has only one light for every 87 miles. Of the 2,814 in existence at the commencement of 1867, about 2,300 had been established since 1830, while the power of the greater part of those existing prior to 1830 has been increased.

Patents.

From Commissioners of Patents' Journal, October 8.

GRANTS OF PROVISIONAL PROTECTION.

Axles, &c., bearings for—2786—I. Farrell.
Bobbins or spools—2740—J. Elce.
Boiler tubes—2808—J. R. Swann.
Bottles, stoppering—2782—G. L. Morton.
Braces, &c., buckles for—2790—J. P. Turner.
Cartridges—2747—R. L. Hickes.
Chair and trunk nails—2629—W. H. Richards.
Coffee, apparatus for extracting the essence of roasted—2546—E. A. Campbell.
Crucibles, &c., manufacturing—2719—N. J. Dor.
Dampness and saltpetre, compositions for the prevention of—2442—H. Dupland.
Dyeing and printing, green colouring matter for—2818—C. D. Abel.
Fire-bars—2788—J. T. Gaze and J. Hymas.
Floors, roofs, &c.—2709—R. Stone.
Furnaces, feeding with fuel—2774—J. B. Spence.
Furnaces—2812—W. Kendall.
Furnaces—2830—W. Walker and D. Davies.
Gas lamps, lighting and extinguishing—2534—H. P. Stephenson, E. G. Bartholomew, and R. King.
Geographical game—2695—W. E. Gedge.
Gig mills, &c., scrays or tables applicable to—2834—W. & A. Kempe.
Goods, machinery for folding piece—2792—J. Worrall & J. Kershaw.
Gun carriages and slides—2796—G. W. Rendel.
Harvesting machines—2826—W. R. Lake.
Head, coverings for the—2800—W. Boulderson.
Horse-shoe nails—2824—A. V. Newton.
Horses, &c., shoes for—2766—J. F. R. Badiou and F. Bernard.
Iron and steel—2724—J. G. Willans.
Iron kegs, &c.—2741—R. Swift.
Lifting apparatus—2638—H. D. P. Cunningham.
Liquids in ebullition, apparatus for preventing boiling over—2677—W. E. Gedge.
Locomotive engines and railway carriages—2480—W. N. Hutchinson.
Looms—2802—J. Peel, J. Sharp, and J. Walworth.
Looms—2820—J. Bullough.
Metal and wood fencing—2760—E. Hernulewicz.
Metal surfaces, producing devices, &c., on—2776—W. H. Hewett.
Metals, machinery for cutting or shaping—2727—C. Winn.
Millstones, &c., chisels and picks for dressing—2794—J. C. Cushion.
Motive-power, obtaining—2804—J. Hastie.
Porcelain-faïence and pottery—2531—A. F. Cederwaller and A. F. Westerlund.
Pots for containing butter, &c.—2828—A. J. Dulake.
Pumps, &c.—2752—R. R. Gibbs.
Railway switches, &c., locking apparatus for controlling—2742—J. l'Anson, jun.
Sanitary purposes, apparatus for—2748—M. Macleod.
Shafts, &c., pumping water from—2754—J. Tarbuck and T. Burns.
Ships' compasses—2780—J. H. Davis.
Spirits, &c., purifying—2746—A. V. Newton.
Steam boilers—2716—H. W. Hartman and W. Lancaster.
Sugar and syrups, purifying solutions of—2756—W. R. Lake.
Tapes, manufacturing binding—2720—C. Belier.
Threads, &c., machinery for untwisting—2770—G. A. C. Bremme.
Threshing machines—2758—A. V. Newton.
Timber, machine for tenoning—2832—D. Duthie.
Umbrellas, &c.—2750—G. H. Chatwin.
Velocipedes—2729—J. N. Steiner.
Velocipedes, &c., motive-power for driving—1645—G. J. Pedley and H. Grabowski.
Vessels, propelling—2762—D. Witty.
Water taps and cistern apparatus—2731—A. Tylor.
Wheels, tyres for—2764—J. Watson.
Wool, machinery for preparing—2621—T. H. Blamires.
Wool, &c., machinery for carding—1718—J. and R. Tatham.
Wool, &c, machinery for roving and spinning—2816—W. Whiteley.
Yarn, removing dye wood from—2798—T. Hall, J. B. McKerrow, and T. R. Shaw.

INVENTION WITH COMPLETE SPECIFICATION FILED.

Balance for ascertaining the specific gravity of liquids, &c.—2859—A. Bodart.

From Commissioners of Patents' Journal, October 12.

PATENTS SEALED.

1132. R. E. and C. Marshall.
1133. W. Gillespie.
1137. F. Erskine.
1141. E. Dowling.
1145. W. H. and T. Hacking and J. Chambers.
1152. J. H. Johnson.
1163. E. Cooper.
1169. J. H. Johnson.
1170. W. J. Cowlman & A. Doe.
1171. A. K. Rider.
1172. F. Mulliner.
1177. S. Harrison.
1190. T. Page.
1212. G. Green.
1224. M. Henry.
1232. J. H. A. Bleckmann.
1275. O. Engholm.
1281. I. Farrell and W. Turner.
1338. R. Ward.
1339. E. Tutte.
1361. P. Southern.
1363. E. Thomas, sen., E. Thomas, jun., and J. Morris.
1373. A. V. Newton.
1374. W. E. Newton.
1486. J. H. Johnson.
1490. I. M. Milbank.
1534. R. E. Keen.
1566. J. P. Nolan.
1683. H. Holdrege.
1735. G. E. King.
1749. J. and S. W. Varley.
1824. D. Fitzgerald.
1825. P. Jensen.
1865. J. H. Johnson.
1892. R. Olpherts.
1930. R. Olpherts.
2001. W. Frazer.
2087. W. R. Lake.
2090. W. R. Lake.
2102. W. R. Lake.
2118. J. A. Horlick.
2119. J. A. Horlick.
2358. W. Manwaring.
2409. J. H. Johnson.
2438. T. Ward and W. S. Black.
2449. J. Lawson & E. G. Fitton.
2477. W. Campion.
2501. J. Baur.
2528. W. R. Lake.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

2566. J. C. Chapman.
2571. G. Gordon.
2720. J. G. Tongue.
3389. J. Rodgers.
2591. W. E. Newton.
2608. W. Dudgeon.
2630. A. V. Newton.
2645. E. Beanes.
2653. E. M. Boxer.
2601. M. Mirfield and J. Scott.
2607. T. Outram.
2609. C. J. Hill.
2613. G. Pitt.
2654. W. Rossetter.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

2710. H. D. P. Cunningham.
2762. F. G. Grice.
2818. J. Tangye.
2735. J. Lowe and J. Harris.